PU020117

Serial No. 10/511,401
Customer No. 24498

Listing of the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) In a system for processing a signal containing video data comprising groups of interleaved trellis encoded data packets, an apparatus for providing trellis decoded data, comprising:

first means for adaptively filtering signal distortions;

first means for identifying and re-encoding trellis decoded data as received from the first means for adaptively filtering signal distortions;

a feedback filter responsive to the re-encoded trellis decoded data; and

a trellis decoder responsive to an output signal generated by the feedback filter, the trellis decoder providing trellis decoded data.

2. (Previously presented) A system according to claim 1, wherein the first means for adaptively filtering signal distortions is a first decision feedback equalizer.

3. (Previously presented) A system according to claim 2, further including a second decision feedback equalizer comprising the feedback filter responsive to the re-encoded trellis decoded data.

4. (Previously presented) A system according to claim 3, further comprising a module, the module comprising the second decision feedback equalizer and the first means for identifying and re-encoding trellis decoded data as received from the first means for adaptively filtering signal distortions.

5. (Previously presented) A system according to claim 4, further comprising a plurality of modules, wherein a first module is responsive to data from the first means for adaptively filtering signal distortions, each succeeding module is responsive to data received from a preceding module and the last trellis decoder is responsive to data received from the last module.

2

PU020117

6. (Previously presented) A system according to claim 5, wherein each module further comprises:

a delay unit for synchronizing data received from a previous stage; and

a feed forward filter responsive to data received from the delay unit.

7. (Previously presented) A system according to claim 6, wherein the first means -for identifying and re-encoding trellis decoded data residing within the module is adapted to generate a hard decision data output.

8. (Previously presented) A system according to claim 6, wherein the first means for identifying and re-encoding trellis decoded data residing within the module is adapted to generate a soft decision data output.

9. (Previously presented) A system according to claim 8, wherein the first means for identifying and re-encoding trellis decoded data residing within the module is adapted to generate a soft decision data output satisfying an equation

$$\tilde{I}_j = \sum_{m=1}^{M} P_{jm}^{(sp)} \cdot I(m)$$

where $I(m)$ is a channel symbol corresponding to a label $m = 1,2,...,M$.

10. (Original) In a system for processing video data comprising groups of interleaved trellis encoded data packets, a method of providing trellis decoded data comprising the steps of:

applying adaptive filtering to the video data and thereby generating a first output signal responsive to the adaptive filtering;

decoding and re-encoding the first output signal and thereby generating a re-encoded output signal;

applying the re-encoded output signal to a second adaptive filter and thereby generating a second output signal; and

3

applying the second output signal to a trellis decoder and thereby generating a decoded output signal.

11. (Original) A system according to claim 10, further comprising the step of forming a module that performs the steps of:

decoding and re-encoding the first output signal; and

applying the re-encoded output signal to a second adaptive filter.

12. (Original) A system according to claim 11, wherein each module further comprises a delay unit for synchronizing data received from a previous stage.

13. (Original) A system according to claim 12, further comprising the step of cascading a plurality of modules so as to receive the first output signal and subsequently apply a final output signal to the trellis decoder and thereby generate the decoded output signal.

14. (Original) A system according to claim 13, further comprising the step of applying the re-encoded output signal within each module to the feedback filter in the same module.

15. (Original) A system according to claim 14, further comprising the step of decoding and re-encoding within each module so as to generate a re-encoded output signal that is a hard decision version of the interleaved trellis encoded data packets.

16. (Original) A system according to claim 14, further comprising the step of decoding and re-encoding within each module so as to generate a re-encoded output signal that is a soft decision version of the interleaved trellis encoded data packets.

17. (Original) A system according to claim 16, wherein the step of decoding and re-encoding trellis decoded data residing within each module generates a soft decision data output satisfying an equation

4

PU020117

$$\widetilde{I}_j = \sum_{m=1}^{M} P_{jm}^{(sp)} \cdot I(m)$$

where $I(m)$ is a channel symbol corresponding to a label $m = 1,2,\ldots,M$ and $P_{jm}^{(sp)}$ is the *a posteriori* probability of the $m^{(th)}$ channel symbol at time j for the survival path (sp).

18. (Previously presented) An equalizer/trellis decoder system for processing high definition television signals, comprising:

a first adaptive filter;

a trellis decoder and re-encoder adapted to receive trellis encoded data packets from the first adaptive filter;

a second adaptive filter adapted to receive an input signal generated by the trellis decoder and re-encoder; and

a final trellis decoder adapted to receive an input signal from the second adaptive filter.

19. (Previously presented) The equalizer/trellis decoder system of claim 18 wherein the second adaptive filter is a decision feedback equalizer further comprising:

a feedback filter; and

a feed forward filter.

20. (Previously presented) The equalizer/trellis decoder system of claim 19 further comprising a delay unit adapted to receive as an input a signal that is an input to the first adaptive filter, the delay unit being interconnected to and synchronizing data received by the feed forward filter.

21. (Previously presented) The equalizer/trellis decoder of claim 20 wherein an output signal generated by the trellis decoder and re-encoder produces soft decision data.

5

Serial No. 10/511,401
Customer No. 24498

PU020117

22. (Previously presented) A system according to claim 21, wherein the output signal generated by the trellis decoder and re-encoder satisfies an equation

$$\tilde{I}_j = \sum_{m=1}^{M} P_{jm}^{(sp)} \cdot I(m)$$

where $I(m)$ is the channel symbol corresponding to the label $m = 1, 2, \ldots, M$ and $P_{jm}^{(sp)}$ is the a posteriori probability of the $m^{(th)}$ channel symbol at time j for the survival path (sp).

23. (Previously presented) The equalizer/trellis decoder of claim 19 wherein an output signal generated by the trellis decoder and re-encoder produces hard decision data.

24. (Previously presented) A system according to claim 18 wherein the first adaptive filter is a Decision Feedback Equalizer operating in either (hard) automatic switching mode or soft automatic switching mode.

6